

Interactive comment on “Tune in on 11.57 μ Hz and listen to primary production” by Tom J. S. Cox et al.

Anonymous Referee #2

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The manuscript show new insights for the in situ calculation of primary production, which is a mile step in marine science. Oxygen measurements are available for many locations and even long time series are available. The background and calculations is quite complicated. I assume that the author would like to address an audience like me, interested and familiar with PP measurements but not too deep into wave-length physics. To address this audience the author need to explain his ambitions more clearly. I wonder where this 11,57 μ HZ wavelength comes from. It is not mentioned in the paper. Some schematic overview figures might help to explain the calculation steps the wave length theory. It would be nice to have a few more background information about tidal consistent O1, Q1, P1 and K1. Most of the figures are poorly labelled, which makes the understanding even harder.

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In more detail:

Introduction What does O1 Q1 K1 and P1 stand for?

Where does the idea with the carrier wave come from. Why is it $11,57\mu\text{Hz}$. How is it possible that it is always the same wavelength independent from e.g. the season?

Maybe a schematic overview would help me to understand it. Page 1, line 1: an an

Page 1, line 2: on on

Page 2, line 32: on on

Page 3, line 7: order order

Page 4, line 28: where does the dynamic of the biomass come from?

Results: Fig. 1: Can you add the measured O₂ values into top figure og Fig. 1? Please add the unit to GPP. I would call it reconstructed GPP or GPP from complex demodulation. That would be less confusing.

Page 5, line 5 O₂

Page 5, line 13: It might come as a surprise. . . Should be part of the discussion to say how good your method is.

Fig. 2: Include measured O₂ data, unit of GPP and use the same names for the legend and color order in the legend.

What is a 1 day low pass filter? Maybe you could already make more clear which method was used for which figure at the end in the material and method part. Maybe it is possible to build up the whole story less in the strict structure of a paper and rather as a story saying we did this, found this which lead us to the next step the use of a 1 day low pass filter.

Page 5, line 22: Most it be overestimation? Isn't it possible that your calculation is better than the simulation?

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Fig. 3: What is $|F(x)|$? It is very hard to find O1 and K1 . . . in the figure. Has Fx or f a unit? Please include.

Page 5, line 26: diurnal frequency is f [cycles per day]? Constant nomenclature makes understanding easier. Is it a point for every day of the year? Why are the dots connected with lines?

Does the $11,57 \mu \text{ Hz}$ comes from one of the calculated Amplitudes?

Fig. 4: (center) please add labeling of x-axis and unit for $F(x)$.

Page 6, line 1pp. The explanation of the behavior of wavelength is important but I would not include it into the results part.

Page 6, line 7 ($T = \dots$)

What does it mean that the period of the amplitude is 365.1

Fig. 5: (top) again axis label, what does List\$WLres mean? What index? Are there any units? (bottom) Units and label please. Where do I see P1, K1? What are the lines? In the description (bottom) is not mentioned. Plus the second sentence should be part of the results it is not a figure description.

The $11,57 \mu \text{ Hz}$ is not mentioned in the text at all.

Page 7, line 16: O2

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